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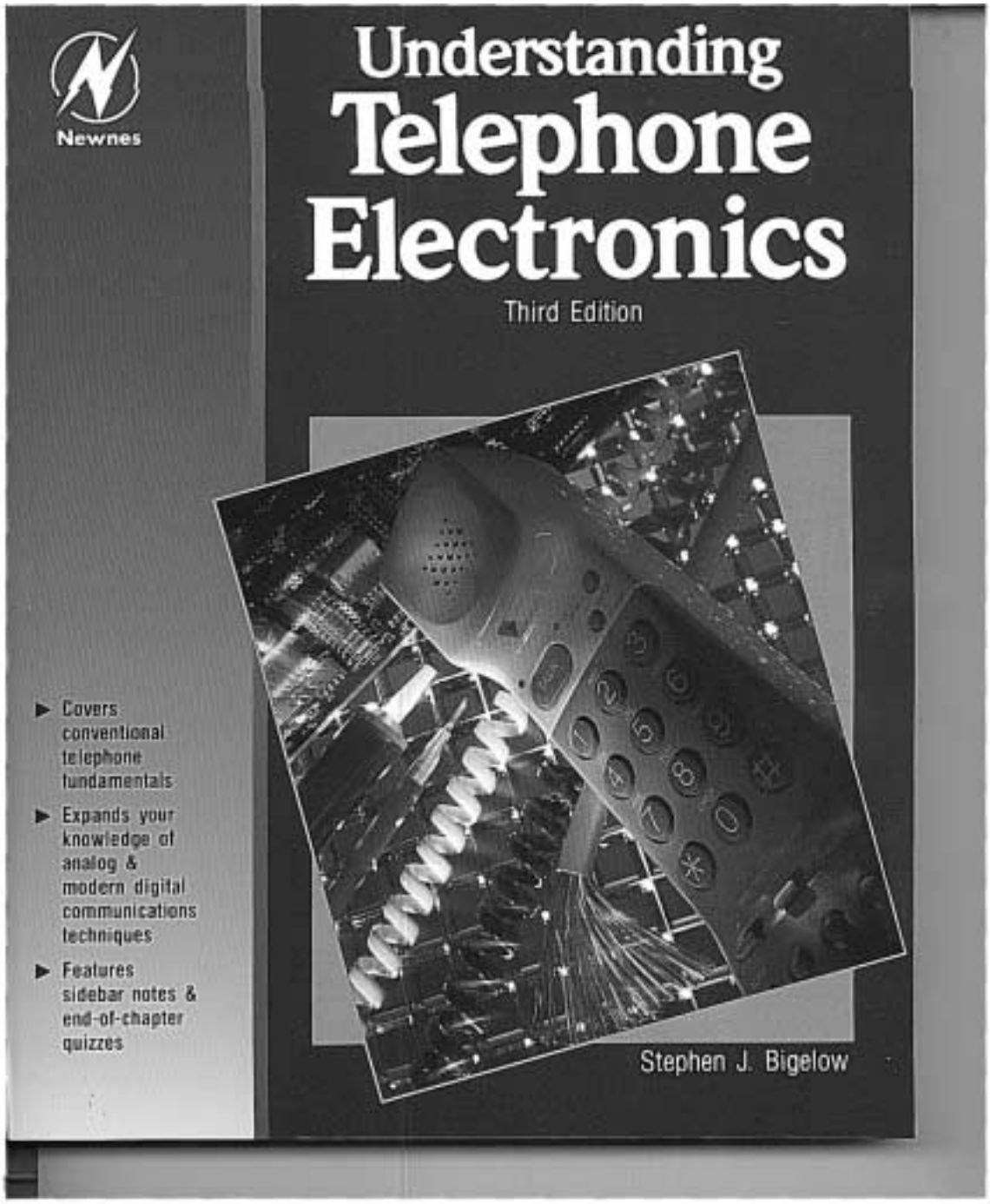

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Preface

The public switched telephone network in the United States of America is one of the true marvels of the modern world. It provides the ability to interconnect any two out of more than one hundred million telephones, usually within a few seconds of the request for connection. It is controlled by the world's largest network of interconnected and cooperating computers. Yet the telephones in this network are usable by unskilled operators without formal training (almost any child of four or five can make a telephone call).

This book is in part about that network and the technology that has made it possible. But it is more about revolutionary changes that are taking place in the way telephone conversations and data are taken into the network, switched, and transmitted. Some of the technology still in everyday use in the telephone network dates from the decade of the invention of the telephone in the 1870s. However, even this old and traditional business is being forced by economics, regulation, and competition to make massive changes in the way it does business and in the equipment and techniques used to provide the telephone service.

We begin by presenting the fundamentals of the telephone network: how it began, what the components are, and how they are connected together. Next we review the basic nonelectronic telephone set. We then consider the effect of microelectronics on the construction and operation of the telephone set; for example, the effect on functions such as speech signal processing and interface with the telephone line, pulse and tone generation for dialing, and ringers. Next, we discuss how microcomputers use digital techniques and stored programs to enhance the performance and features of the telephone set. Digital transmission techniques, electronics in the central office, and network transmissions concepts and fundamentals are explained. Finally, we briefly consider the relatively new cordless phone set and the new concept of mobile radio and cellular phone service.

Like other books in the series, this book builds understanding step-by-step. Try to master each chapter before going on to the next one. A quiz is provided at the end of each chapter for self-evaluation of what has been learned. Answers are given at the back of the book.

The business of providing the equipment and service for both local and long distance telephone communication is today undergoing some of the most fundamental changes ever required to be made by any U.S. institution. Before the government breakup of AT&T in January 1984, it was the largest company on earth, and its product is a service that has become a necessity for all of us. Understanding the technical side of the telephone is necessary in understanding a force in modern life which has been and will continue to be as much an agent for change as the automobile, the airplane, and the computer.

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Understanding Telephone Electronics

Third Edition

Powerful, streamlined electronics has brought both lower costs and expanded capabilities to telephone electronics. Now you can put America's sophisticated telephone network to work for you with this updated, expanded guide—*Understanding Telephone Electronics*, Third Edition.

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Strengthen your understanding of this important everyday tool with *Understanding Telephone Electronics*, Third Edition.

Stephen J. Bigelow is an electrical engineer who has been a telecommunications service engineer. He has authored technical articles about telecommunications subjects for electronic enthusiasts and has published articles in such top consumer electronics magazines as *Popular Electronics* and *Modern Electronics*.

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Packed with essential reference material and illustrations, this user's guide helps you:

- ▶ **Understand telephone fundamentals**
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- ▶ **Find out how electronic circuits generate pulse and tone dialing signals**
- ▶ **Discover the latest digital transmission techniques**
- ▶ **Understand A/D and D/A conversion**